AMBER model 5500

PROGRAMMABLE AUDIO MEASUREMENT SYSTEM

OWNER'S MANUAL

SECTION 8

TECHNICAL DOCUMENTATION

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TECHNICAL DOCUMENTS

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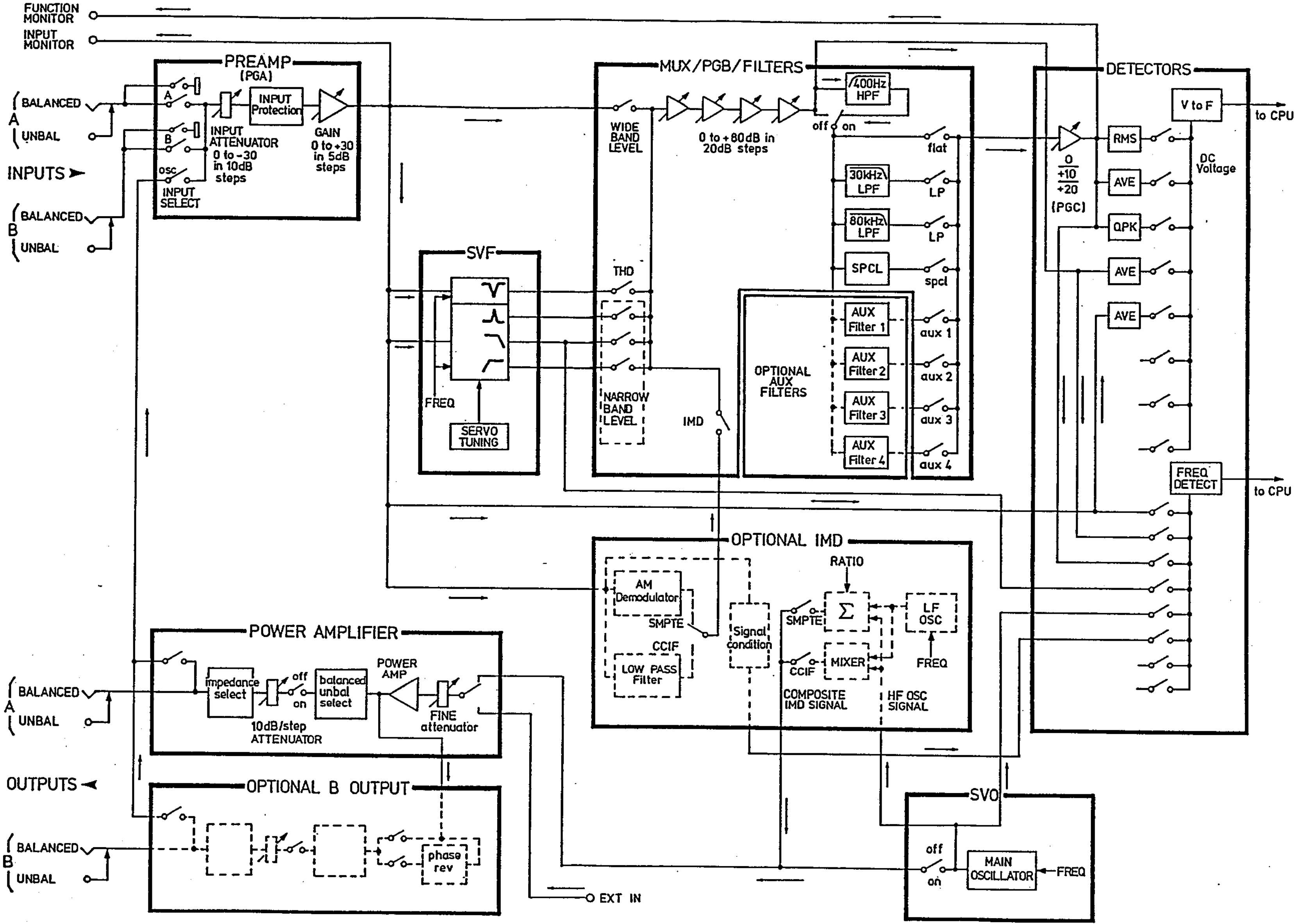

Amber model 5500
Programmable Distortion & Noise Measuring System
FUNCTIONAL BLOCK DIAGRAM

8.1 GLOSSARY

ADDR Addressed. Indicates that the 5500 has been addressed over the GPIB interface. (An IEEE-488 mnemonic)

ASCII American Standard Convention for Information Interchange. Defines an 7-bit code for each of up to 128 characters to facilitate data exchange between devices.

AVE Average. A measurement of the time weighted average of the absolute value of an AC signal. Most older analog meters yield the average detected, rms calibrated value of AC signals and this 5500 detector has been included to allow correlation of these measurements.

BNC Bayonet Connector. A coaxial 2-terminal connector used to connect single ended (unbalanced) signals between the 5500 and external devices.

BP Band Pass (filter). Usually refers to the band pass filter mode of the Narrow Band Level function of the 5500 or the actual filter (SVF) that achieves the function.

CCIF Comite Consultatif International Telephonique. An organization that has defined a method for IMD measurement that uses two frequencies of equal amplitude and closely spaced as the test signal. The 5500 measures the even order products (or difference frequency) and expresses this as a ratio of the amplitude of either of the two test signals. Also called DIFFERENCE FREQUENCY DISTORTION (DFD).

CCITT Comite Consultatif International Telephonique et Telegraphique. A European based standards organization that specifies a number of methods of audio measurement. The related specifications here are P-53A Psophometric and P-53B Program that are used in telecommunications and communications applications.

CCIR International Radio Consultation Committee. A European based standards organization that specifies a number of methods of audio measurement. The relative specification here is 468-3 which specifies a noise weighting curve, detection characteristic and measurement method.

CLR Clear. May either be the GPIB SDC or DCL command or the front panel Clear key. (An IEEE-488 mnemonic)

CPU Central Processing Unit. Usually refers to the heart of a computer system. In the case of the 5500, refers to the particular integrated circuit and support circuits that form the internal computer.

CR Carriage Return. A code generally used to conclude a series of characters in a data transmission.

CRT Cathode Ray Tube. Generally refers to a computer terminal or display device connected to the serial (RS232) interface.

dBm Decibels referenced to 1 milliWatt. The ratio in dB of a measured signal level to a reference signal that produces 1 mW of power. Strictly speaking, a power measurement, but the 5500, like all voltmeters or signal level meters, measures signal level in Volts and, using an impedance reference, calculates an implied power and expresses this power as a dB ratio to 1 mW. If the reference impedance is 600 ohms, the voltage for 0 dBm is 775 mV. Sometimes called dBu.

dBV Decibels referred to 1 Volt. The ratio in dB of a measured signal level to a reference signal level of 1 Volt. Numerically the same as dBm if the reference impedance is 1000 ohms.

DCE Data Communications Equipment. One of the two configurations that the RS232 interface may take. Usually the controlling equipment (e.g. modem or CPU) assumes the role of DCE. The 5500 may be set to the DCE configuration. See also DTE.

DF Difference Frequency. The numeric difference between the two high frequency components of the CCIF IMD composite test signal. See also OF.

DIN Deutsches Institut fur Normung. An organization that specifies a number of methods of audio measurements. The particular reference here is an IMD method, similar to the SMPTE method, but using frequencies of 50 Hz and 8 kHz.

DTE Data Terminal Equipment. One of two configurations that the RS232 interface may take. Usually the peripheral equipment assumes the role of DTE. The 5500 may be set to the DTE configuration. See also DCE.

GND Ground. The low or reference terminal of a signal connector. The 5500 has several separate grounds: chassis/mains ground, analyzer ground, oscillator ground, digital ground, communications ground.

GPIB General Purpose Interface Bus. An industry standard method for communications between instruments and computers. Techniques, protocol, and physical implementation are defined in the IEEE-488 standard.

HF High Frequency. Refers to the higher frequency component of the SMPTE or DIN IMD composite test signal. (Example : 7 kHz)

HPF High Pass Filter. A band limiting or noise weighting filter that has a flat unity gain response above a defined cutoff frequency with a constant slope (i.e. constant dB per octave) roll-off with decreasing frequency below the cutoff.

IEEE-488 Institute of Electrical and Electronic Engineers Standard no. 488. A definition of the GPIB interface. See GPIB.

I/O Input and/or Output. Generally used to define ports.

IMD Intermodulation Distortion. Distortion produced by the non- linearities in a device under test shown by the interaction of a composite two-frequency test signal. The output of the device under test contains, in addition to the original composite twin tone test signal, additional distortion components at frequencies mathematically related to the frequencies of the test signal (example, distortion products will appear at the sum and difference of the original test signal).

INCR Increment. The amount the frequency or amplitude is changed when the UP or DOWN button is pushed.

LCL (Return to Local). A GPIB command. When the 5500 LCL button is pushed, the front panel is again reactivated (if the instrument is not in local lockout state).

LF Low Frequency. Refers to the lower frequency component of the SMPTE or DIN IMD composite test signal. (Example : 60 Hz)

LF Linefeed. A code use to advance a printer or other device after completion of a series of characters in a data transmission.

LIN Linear. Refers to a certain class of measurement units used in the 5500: Volts, Watts, percent.

LLO Local Lock Out. A GPIB command. When the 5500 is in the LLO + REM mode, the front panel is inoperative. Control is then via the GPIB interface.

LPF Low Pass Filter. A band limiting or noise weighting filter that has a flat unity gain response up to the cutoff frequency then a constant slope (i.e. constant dB per octave) roll-off with increasing frequency.

LOG Logarithmic. Refers to a certain class of measurement units used in the 5500: dB, dBm, dBV.

NBL Narrow Band Level. Signal level in a limited bandwidth. The band width is defined by the Band Pass, Low Pass or High Pass filter in the 5500 with center or cutoff frequency defined by the user.

OF Offset Frequency. One half the difference between the two test frequencies of the CCIF IMD composite signal or the offset from the mean of the two frequencies. Example, if the two frequencies are 14 kHz and 15 kHz, the mean is 14.5 kHz. The offset is 500 Hz and the difference is 1 kHz.

OSC Oscillator. Refers to the sine wave signal source in the 5500. May also be called the generator although generator usually comprises both the oscillator and the output power amplifier and attenuator.

PGA Programmable Gain A. The input section of the 5500 receiver or analyzer. The gain (or loss) of this stage is programmed by the computer in the 5500. See the block diagram in the technical section.

PGB Programmable Gain B. An intermediate gain stage in the 5500 analyzer. PGB follows PGA and the SVF, if selected. It provides signal gain to boost low signal levels to an appropriate level for the detectors.

PGC Programmable Gain C. In the same path as PGB. PGB feeds any weighting filters that may be selected and PGC follows the weighting filters to make up any signal level lost in the filters before presentation to the detectors.

QPK Quasi-Peak. A signal level detector that measures the highest peak level of a time varying signal but with a finite attack time and slow release time to give some averaging to the measurement. Quasi- peak time constants are defined by the CCIR-468-3 standard.

RAM Random Access Memory. Computer accessed memory that may be periodically read and modified by the computer when necessary.

RCL Recall. The process of recalling a previously stored state of the 5500 from non-volatile memory.

REM Remote. A GPIB command. When the REM indication is illuminated in the front panel GPIB area, the 5500 is able to receive and accept commands via its GPIB interface. The front panel is inoperative except for the LCL and CLR keys (unless LWLS).

rms Root Mean Square. A measurement of the effective value of a time varying (i.e. AC) signal. The 5500 uses a "true rms" detector to measure signal level.

RS232 Serial Interface Standard (EIA). Defines certain characteristics for industry standard communications interface. The 5500 can be set to implement most of the variations of the standard.

RTS Ring-tip-sleeve. A telephone style 3-conductor connector used to connect differential (balanced) signals between the 5500 and external devices. Also, related to RS232 "request to send" mnemonic.

SMPTE Society of Motion Picture and Television Engineers. An organization that has, among other activities, defined a particular IMD measurement technique and test frequencies: 7 kHz and 60 Hz mixed in a 1 to 4 amplitude ratio.

SPCL Special. Usually refers to the Special Functions on the 5500. These are set-up or seldom used parameters and configurations inside the 5500 that are changed by entering a SPCL FNCT code. May also refer to a not defined noise weighting filter (SPCL FIL).

SRQ Service Request or Request for Service. A GPIB command.

STO Store. The process of placing the status of the 5500 in a non- volatile memory.

SVF State Variable Filter. Programmable filter in the 5500 analyzer used for the notch function in THD and the band pass, low pass, and high pass functions in Narrow Band Level.

SVO State Variable Oscillator. Primary programmable oscillator in the 5500 generator section.

THD Total Harmonic Distortion. A measurement of the rms sum of all harmonics of a signal as a ratio of the fundamental.

THD+N Total Harmonic Distortion plus Noise. A measurement of the rms sum of all harmonics and noise of a signal within the measurement bandwidth as a ratio of the fundamental.